

PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Improvements in or relating to Liquid Flow Control Valves

WE, J. GOSWAMI & JOHN LAWRENCE & CO., of 11/13 Bishopsgate, London, do hereby declare the invention for which we pray that a Patent may be granted to us, and the method by which it is to be performed to be particularly described in and by the following statement:— This invention is for improvements in or relating to liquid flow control valves and has for one of its objects to provide a simple and inexpensive valve arrangement which is efficient in operation. A further object is to provide a simple form of valve suitable for use in domestic appliances. In accordance with the invention there is provided a liquid flow control valve comprising a flexible pipe and mountings for portions of the pipe, each mounting being adapted to enclose a portion of the pipe. The mountings are so arranged that they may be moved along the pipe so as to form a tight or fluid-tight seal against the pipe. By varying the degree of relative angular displacement between the two mountings the flow passage can be caused to be restricted to a greater or less extent so that regulation between full opening and complete closure is possible. In a preferred form of construction the valve comprises two rigid plates or strips hinged to one another and respectively supporting end-ports for portions of the flexible pipe. Such end-ports may be formed as ring forming eyes through which the pipe passes or loops to embrace the pipe. In the latter case the plates or strips are arranged through the end-ports, passed the hinge transversely of the axis thereof and along the outer plate or strip and through the end-ports of the other plate or strip. The plates or strips are arranged to be capable of being so that the angle advanced between them on the side of the pipe can be varied from 180° to an acute angle of about 60°. In the latter setting the pipe will be fully closed to stop all the passage through it. In a convenient construction the hinged mountings for the pipe are spring operated so urge them to the closed setting and are arranged to be opened by a cam or lever to move them away from the closed setting against the action of the spring. The operation of the valve may be controlled manually by a hand lever or other manual control or it may be controlled automatically by a power operated cam or lever. The invention is particularly applicable to a liquid control valve for a washing machine to control the supply of additive to the washing liquid. The invention accordingly includes a washing machine incorporating a valve as above described for the control of such additive. A particular application of the improved valve is to a dish washing machine and it may be employed for controlling the supply of detergent to the washing liquid or also additive to the rinsing liquid. In this case the valve is conveniently arranged to be capable of being powered to the required degree of opening to suit particular conditions so that just the required amount of additive will be supplied at each cycle operation. Such a machine may be supplied with two valves according to the invention respectively controlling the amount of the supply of detergent and also additive. In applying the improved valve to a dish washing machine the pump which supplies liquid to the washing chamber conveniently has a one junction at its inlet, one arm of the two junctions being connected to a water supply and the other arm of the junction being connected to a supply of additive through a valve as above described. In order that the present invention may be more readily understood reference will now be made to the accompanying drawings in which:— Figure 1 is a side view of a valve according to the invention in open position. Figure 2 is a similar view to that of Figure 1 with the valve in closed position, and Figure 3 is a schematic diagrammatic elevational view in cross section of a portion of a dish washing machine. In the drawings a pair of plates members 1 and 2 are hinged together about a hinge pin 3. The plates members 1 and 2 have rings 4 and 5 forming eyes attached to them respectively. These rings are attached to the plates consecutively by soldering or brazing and are arranged to have smooth surfaces. Located between the rings 4 and 5 is a spring 6 tending the plates to adapted position shown in Figure 2. Located on the plate 1 is a screw threaded bush or boss 7 for co-operation with the screw threaded element 8. A hollow cylinder member 9 forming part of a connection between a source of fluid and a member to be supplied with fluid is passed through the eyes 4 and 5. It will be understood that when the plate 1 is moved from a position illustrated in Figure 2 in which the tube 9 is closed to a position in which the full bore of the tube is opened the passage of fluid through a transverse edge of member 1 to give a control of the rate of fluid passing there-through. It will be appreciated that such a valve as herein described may be operated by hand but in the embodiment illustrated the screw threaded element 8 is preferably connected to a cam device (not illustrated) to operate the valve. By adjusting a constant screw or die can and by adjusting the element 8 the valve can be set to open to a certain extent and the extent to which the tube is opened or closed may be adjusted. When the valve is applied to a washing machine to control the supply of an additive to the washing or rinsing liquid the valve would be located between a reservoir of the additive and the figure container or a pump supplying the liquid container. In the embodiment described the knob is formed in the tube 9 by connecting the tube across plates 1 and 2 but it will readily be appreciated that the invention may be modified by arranging the tube on the opposite side of the plates 1 and 2 and arranging the hinge to form a knob in the tube over the face formed by the hinge. Figure 3 shows in cross section a device

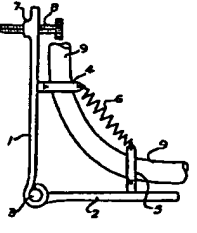


FIG. 1.

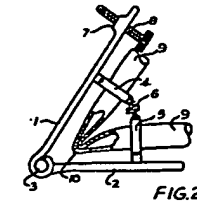


FIG. 2.

part of a dish washing machine having a water casing 12 and a working chamber 13 having its walls spaced inwardly from the casing 12 and the working chamber there is mounted a reservoir 14 for additive liquid which may have a level indicator 15 appearing through a slot in casing 12. From the reservoir 14 there extends a supply tube 16 connected to the other member 2 of the control valve. The outlet from the tubular member is indicated by a pipe 17 to a one junction 18 the other 19 of which runs to a pump sump indicated at 20. The other arm of the one junction is connected by a pipe 21 to a source of water supply. Alternatively the pipes 17 and 21 may each be connected directly to the sump 20, the one junction 18 being situated. The control valve is shown diagrammatically as being operated by a lever 22 (which may be cam operated) engaging the head of the screw threaded element 8 so that as appropriate times the control valve is opened against the action of the spring 6 to allow supply through it of the additive liquid. The extent to which the valve is opened is power by adjustment of the setting of the screw threaded element 8. WHAT WE CLAIM IS:— 1. A liquid flow control valve comprising a flexible pipe and mountings for portions of the pipe, each mounting being adapted to enclose a portion of the pipe. 2. A valve according to Claim 1 wherein the mountings are formed as rings forming eyes through which the pipe passes, or loops to embrace the pipe. 3. A valve according to Claim 1 or Claim 2 wherein the plates or strips are connected so as to be capable of being so that the angle advanced between them on the side of the pipe from 180° to an acute angle of about 60°. 4. A valve according to any of the preceding Claims wherein the hinged mountings for the pipe are spring operated to urge them to the closed setting and are arranged to be opened against the spring action to move away from the closed setting. 5. A valve according to Claim 4 wherein the hinged mountings for the pipe are arranged to be opened against the spring action by means of a cam or lever. 6. A washing machine comprising a liquid

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flow control valve as claimed in any of the preceding Claims for controlling the supply of additive to the liquid. 7. A washing machine according to Claim 1 wherein the flow is arranged to be passed to a required degree of opening to suit particular conditions. 8. A dish washing machine according to Claim 1 or Claim 2 having a pump which supplies liquid to the washing chamber provided with a one junction at its inlet, one arm of the junction being connected to a supply of water and the other arm of the junction being connected to a supply of additive through a valve as above described. 9. A washing machine embodying a liquid control valve constructed substantially as hereinbefore described with reference to the accompanying drawings. ERIC POTTER and CLARKESON, Chartered Patent Agents, London and Liverpool.

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